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PATENT SPECIFICATION

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(54) BONDING OF MEMBRANES TO SUBSTRATES

We, RUBEROID LIMITED, formerly The Ruberoid Company Limited, a British Company, of 1 New Oxford Street, London, W.C.1., do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

The invention relates to a method of bonding a continuous membrane to a substrate.

It is an object of the invention to provide an alternative method of partially bonding a continuous membrane to a substrate.

According to the invention, a method of partially bonding a continuous membrane, preferably a waterproofing membrane, to a substrate comprises applying the continuous membrane to the substrate over a perforated sheet with adhesive disposed between the perforated sheet and the substrate, the continuous membrane being applied in such a manner that adhesive penetrates through perforations in the perforated sheet into contact with the continuous membrane.

The method according to the invention is conveniently carried out by spreading adhesive over the substrate and applying the perforated intermediate sheet and the membrane over the adhesive. The adhesive penetrates or oozes through the perforations in the intermediate sheet into contact with the membrane. The membrane is thus only bonded directly to the substrate in zones which correspond substantially with the perforations in the intermediate sheet. Other zones or areas of the membrane are not bonded to the substrate as the intermediate sheet acts as a barrier to the adhesive in those zones.

Gases may thus flow between the inter-

mediate sheet and the membrane along the unbonded, inter-communicating zones and the gases may travel to an edge of the membrane. Circulation of air may thus occur between the membrane and the intermediate sheet, with the air flowing from one edge of the membrane to another edge of the membrane. Further, water vapour may travel to an edge of the membrane and thus escape from the waterproofing system when the membrane is a waterproofing membrane.

The partial bonding also permits improved accommodation of movement which may, for example, occur through differential expansion or contraction between the substrate and the membrane.

The intermediate sheet and the membrane are conveniently rolled up together so that the composite roll can be unrolled on to the adhesive coating on the substrate with the perforated intermediate sheet automatically disposed between the membrane and the adhesive-covered substrate.

The invention also provides a roll of a continuous length of a waterproofing membrane interleaved with a non-adherent, continuous length of a perforated sheet.

When lengths of the membrane are to be used in overlapping relation, lap joints between adjacent lengths will normally be fully bonded to one another. The perforated intermediate sheet will thus preferably be narrower in width than the membrane so as to leave a band along one edge of the membrane substantially equal in width to that of the lap joint. A membrane may then be bonded along that band to the upper surface of another membrane which it overlaps.

The invention also includes a substrate,

for example a roof, having a waterproofing membrane adhesively bonded thereto, the bonding adhesive extending from the substrate to isolated zones on the waterproofing membrane through perforations in a sheet disposed between the membrane and the substrate.

The membrane may, for example, be a membrane of a synthetic thermoplastic substance, for example plasticised polyvinyl chloride, or of a natural or synthetic rubber or of a bituminous composition, for example, a mixture of bitumen and/or pitch and polyvinyl chloride, or it may be a resin-impregnated or bitumen-impregnated felt or sheet.

The perforator sheet may, for example, be of felt, paper, glass matting or tissue or asbestos tissue, the perforations in the sheet being at suitable intervals, for example, at regular intervals. The perforations may, for example, form from 10% to 35% of the total area of a face of the perforator sheet.

The adhesive is suitably a bitumen but may be another adhesive.

The substrate may be concrete, for example a concrete roof.

One method of carrying out the invention will now be described by way of example with reference to the diagrammatic drawing accompanying the Provisional Specification.

A roll of a sheet 1 of waterproofing membrane (for example, a membrane of polyvinyl chloride or of a pitch-polyvinyl chloride mixture such as is available on the market under the name "Hyload" (Registered Trade Mark) which was interleaved with a continuous length of a perforated sheet 2 of felt, was unrolled on to a layer of hot bitumen 3 with the sheet 2 in direct contact with the layer of hot bitumen, the layer 3 of hot bitumen having been poured onto a concrete roof 4 just ahead of the roll. One longitudinal edge 5 of the perforated sheet 2 was closely adjacent to the longitudinal edge 6 of the waterproofing membrane 1. The perforated sheet 2 was, however, narrower in width than the waterproofing membrane 1 by an amount by which a longitudinal zone 7 of the sheet 1 overlapped a waterproofing membrane 8 which had been previously laid on the substrate 4 in the same manner. A layer 9 of hot bitumen was also laid on that part of the upper surface of the membrane 8 which was to be lapped by the zone 7 of the membrane 1. The unrolled membrane was then lightly rolled, so causing hot bitumen to penetrate through the perforations in the sheet 2 into contact with isolated areas on the under-surface of the membrane 1. When the bitumen cooled and solidified, the membrane 1 was thereby both lap-jointed to the membrane 8 by the bitumen layer 9 and

partially bonded to the substrate by the bitumen layer 3.

Air from the surrounding atmosphere could enter between the membrane 1 and sheet 2 at the forward edge 10, circulate between the membrane and sheet and emerge into atmosphere from the rear end (not shown) of the membrane and sheet.

WHAT WE CLAIM IS:—

1. A method of partially bonding a continuous membrane to a substrate, which comprises applying the continuous membrane to the substrate over a perforated sheet with adhesive disposed between the perforated sheet and the substrate, the continuous membrane being applied in such manner that adhesive penetrates through perforations in the perforated sheet into contact with the continuous membrane.

2. A method according to claim 1, in which the adhesive is spread over the substrate, and the perforated sheet and the continuous membrane are applied over the adhesive.

3. A method according to claim 2, in which the perforated sheet and the continuous membrane are applied from a common roll.

4. A method according to any one of the preceding claims, in which the perforated sheet is narrower in width than the continuous membrane.

5. A method according to claim 4, in which one longitudinal edge of the perforated sheet is closely adjacent to a longitudinal edge of the continuous membrane.

6. A method according to any one of the preceding claims, in which the continuous membrane is a waterproofing membrane.

7. A method according to claim 6, in which the membrane is of a thermoplastic resin.

8. A method according to claim 7, in which the membrane is of plasticised polyvinyl chloride.

9. A method according to claim 7, in which the membrane comprises a mixture of polyvinyl chloride and bitumen and/or pitch.

10. A method according to claim 6, in which the membrane is of natural or synthetic rubber.

11. A method according to claim 6, in which the membrane is a resin-impregnated felt.

12. A method according to claim 6, in which the membrane comprises a bituminous composition.

13. A method according to claim 12, in which the membrane is a bitumen-impregnated felt.

14. A method according to any one of the

preceding claims, in which the perforated sheet is of or comprises paper.

15. A method according to any one of claims 1 to 13, in which the perforated sheet is of felt.

16. A method according to any one of the preceding claims, in which the adhesive is or comprises bitumen.

17. A method according to any one of the preceding claims, in which the substrate is of concrete.

18. A method according to any one of the preceding claims, in which the substrate is, or forms part of, a roof of a building.

19. A method of partially bonding a waterproofing membrane to a substrate, substantially as hereinbefore described with reference to the drawing accompanying the Provisional Specification.

20. A substrate having a membrane partially bonded thereto, whenever obtained by the method claimed in any one of claims 1 to 18.

21. A roll of a continuous length of a waterproofing membrane interleaved with a non-adherent, continuous length of a perforated sheet.

22. A roll according to claim 21, in which the membrane is made of a thermoplastic resin.

23. A roll according to claim 22, in which the membrane is made of a plasticised poly-vinyl chloride.

24. A roll according to claim 22, in which

the membrane is a resin-impregnated felt.

25. A roll according to claim 21, in which the membrane is a bitumen-impregnated felt.

26. A roll according to any one of claims 21 to 25, in which the perforated sheet comprises paper.

27. A roll according to any one of claims 21 to 25, in which the perforated sheet is of felt.

28. A roll according to any one of claims 21 to 27, in which the perforated sheet is narrower in width than the waterproofing membrane.

29. A roll according to claim 28, in which a longitudinal edge of the perforated sheet is closely adjacent to a longitudinal edge of the waterproofing membrane.

30. A substrate having a waterproofing membrane adhesively bonded thereto, the bonding adhesive extending from the substrate to isolated zones on the waterproofing membrane through perforations in a sheet disposed between the waterproofing membrane and the substrate.

31. A substrate having a waterproofing membrane partially bonded thereto, substantially as hereinbefore described with reference to the drawing accompanying the Provisional Specification.

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PROVISIONAL SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*

